Total No. of Questions : 7]

SEAT No. :

P1007

[Total No. of Pages : 2

[4719]-31
T.Y. B.Sc.
BIOTECHNOLOGY
Bb-331 : Microbial Biotechnology
(Semester-III) (2008 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***Question No. 1 is compulsory.***
2) ***Attempt any four of the remaining questions.***
3) ***Draw neat labelled diagram wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) Answer all questions in 2-4 lines: **[20]**

a) Give one contribution each of Edward Jenner and Joseph Lister.

b) What is mixed acid fermentation? Enlist the organisms and end-products formed in mixed acid fermentation.

c) What is stormy fermentation?

d) Describe the benefits of normal flora.

e) What are F^+ plasmids?

f) Enlist the dyes present in EMB agar.

g) Define chemo-lithotrophs. Give two examples.

h) What is substrate utilisation constant?

i) Micro-organisms causing flavour defects in milk. Give any two examples.

j) Calculate the growth rate of pseudomonas spp. if generation time is 24 minutes.

P.T.O.

Q2) a) What is fed batch culture? What are the different modes of establishing fed batch culture? Give the advantages and applications of fed batch culture. **[8]**

b) Classify organisms based on their temperature requirement. Give the molecular adaptations thermophiles. **[7]**

Q3) a) 'Analogue resistant mutants can play a significant role in strain improvement'. Justify giving examples and give any one method of isolating analogue resistant mutants. **[8]**

b) Discuss Trp operon. **[7]**

Q4) a) Enlist different genito-urinary tract infections and describe any one disease in detail. **[8]**

b) Explain with examples the mode of action of Antiviral drugs. **[7]**

Q5) a) Describe the various methods of food preservation and describe the use of chemical preservatives in food. **[8]**

b) Comment on spoilage of meat and meat products. **[7]**

Q6) a) Explain with the help of neat labelled diagram the working of Activated sludge treatment plant. **[8]**

b) Describe how chlorination is used for disinfection of water. **[7]**

Q7) Write short notes on (Any Three): **[15]**

a) Resazurin test.

b) Role of GMO's in industry.

c) Significance of pentose phosphate pathway.

d) Transformation in gene mapping.

e) Virulence factors.

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Total No. of Questions : 8]

SEAT No. :

P1008

[Total No. of Pages : 2

[4719]-32
T.Y.B.Sc.
BIOTECHNOLOGY
Bb - 332: Animal and Plant Development
(2008 Pattern) (Semester - III) (64023)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

1) ***Answer to each section should be written in separate answer book.***
2) ***Question No.1 Q.No.5 are compulsory. From remaining questions attempt <u>any two</u> from each section.***

SECTION - I

(Animal Development)

Q1) Explain the terms: **[10]**

a) Competence

b) Progenitor cells

c) Hensen's node

d) Apoptosis

e) Vitellogenesis

Q2) a) Describe the process of spermatogenesis and with the help of neat labelled diagram explain the structure of male gamete. **[7]**

b) Describe the process of Gastrulation in frog and add a note on fate of three germinal layers. **[8]**

Q3) a) With the help of model system Drosophila/ any other explain the role of zygotic genes in patterning. **[8]**

b) Describe in details the 'Immunoglobulin genes'. **[7]**

Q4) Write short notes on: **[15]**

a) Teratogenesis

b) Ageing

c) Transgenic animals

P.T.O.

SECTION - II

(Plant Development)

Q5) Explain the terms with respect to plant development: **[10]**

a) Mericlinal chimera

b) Redifferentiation

c) Tunica- Carpus theory of Meristem.

d) Clavata genes

e) Microsporogenesis

Q6) a) With the help of neatly labelled diagram explain embryonic development of dicotyledons. **[8]**

b) What are phytohormones? Discuss the role of any two in detail. **[7]**

Q7) a) Describe axial and radial patterning in plant Arabidopsis thaliang and also mention various genes involved in the process. **[8]**

b) Describe various stages of somatic embryogenesis and its applications. **[7]**

Q8) Write notes on: **[15]**

a) Programmed all death in plant.

b) ABC model of floral patterning.

c) Organogenesis.

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Total No. of Questions : 7]

SEAT No. :

P1009

[Total No. of Pages : 2

[4719] - 33
T.Y. B.Sc.
BIOTECHNOLOGY
Bb - 333 : Biodiversity and Systematics
(2008 Pattern) (Semester - III) (64033)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Out of remaining questions attempt any four.***
3) ***Figures to right indicate full marks.***

Q1) Answer the following in 2-4 lines. **[10 × 2 = 20]**

a) Define with example: Emigration.

b) Define Serology.

c) Why In-situ conservation is preferred over Ex-situ conservation?

d) Enlist types of survivourship curves.

e) Why Ecological natality is always higher than physiological natality?

f) Define γ-diversity.

g) State objectives of biosystematics.

h) Compare and contrast Habitat and Niche.

i) Define territorility.

j) Enlist any four international organisations involved in conservation of nature.

Q2) a) Give an account of bioprospecting of microorganisms with suitable example. **[8]**

b) Elaborate on outline classification of Kingdom fungi. **[7]**

P.T.O.

Q3) a) Explain in detail growth forms of organisms. **[8]**

b) Give an account of strategies used for In-situ conservation. **[7]**

Q4) a) Write minutes of The Environment (Protection) Act, 1986. **[8]**

b) Elucidate stages of development of behaviour. **[7]**

Q5) a) Write a note on importance of molecular taxonomy and micromorphology in classification of organisms. **[8]**

b) Explain criterion used for classification of Kingdom animalia. **[7]**

Q6) a) Illustrate reasons responsible for population fluctuation. **[8]**

b) Explain IUCN categories of organisms. Add a note on biodiversity hotspots. **[7]**

Q7) Write notes on [any three]: **[15]**

a) Molecular chronometers.

b) Importance of biodiversity for Food, fodder, and fibre.

c) Major biomes in world.

d) Species richness.

Total No. of Questions : 7]

SEAT No. :

P1010

[Total No. of Pages : 2

[4719] - 41
T.Y. B.Sc.
BIOTECHNOLOGY
Bb - 341 : Large Scale Manufacturing Process
(2008 Pattern) (Semester - IV)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***Question No. 1 is compulsory.***
2) ***Answer any four questions from remaining.***
3) ***Neat labelled diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) Answer the following in 2-4 lines. **[10 × 2 = 20]**

a) What are load cells? Give its application.

b) What are fixed pore filters?

c) What is an aseptic operation and containment level?

d) Give structure and application of 'O' Ring Seal.

e) What is Dummy variable and what is its importance in medium optimization?

f) What is SOP?

g) Enlist any four substrates used for said substrate fermentation.

h) Define continuous fermentation.

i) What are fixed cost in economics of a bioprocess.

j) What are single cell proteins? Give two examples.

Q2) a) Explain with the help of a flow diagram, the large scale production of any one vitamin with reference to: **[10]**

i) Production strain.

ii) Fermentation medium and environmental conditions used.

iii) Down stream processing.

b) 'Use of filter aids improves the efficiency of filtration'. Justify. **[5]**

P.T.O.

Q3) a) Define Biotransformation. How is biotransformation different from conventional fermentation? Give one example of biotransformation. **[8]**

b) What is the importance of real time estimation of biomass during fermentation? Describe any two methods of real-time measurement of biomass during fermentation. **[7]**

Q4) a) Explain with the help of a neat labelled diagram, the principle and working of a continuous sterilization unit. **[8]**

b) Explain giving examples, how inducers can improve the yield of product. **[7]**

Q5) a) Enlist the different methods of cell lysis used for the recovery of an intra cellular product. Explain the chemical methods for cell disruption. **[8]**

b) Discuss the principle and application of LAL test. **[7]**

Q6) a) Describe the different designs of agitators used in a bioreactor. **[8]**

b) Enlist the different factors affecting $K_L a$. Discuss in detail the effect of airflow rate and microbial biomass on $K_L a$. **[7]**

Q7) Write short notes on (any three): **[15]**

a) Fermentor construction material.

b) Types of sensors in process control.

c) Diagrammatically represent Airlift fermentor using inner loop.

d) Encapsulation method of enzyme immobilization.

e) Importance of energy balance in fermentor.

Total No. of Questions : 8]

SEAT No. :

P1011

[Total No. of Pages : 2

[4719]-42
T.Y.B.Sc.
BIOTECHNOLOGY
Bb - 342: Biotechnology in Agriculture and Health
(2008 Pattern) (Semester - IV) (Backlog)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

1) ***Answer to each section should be written in separate answer book.***
2) ***Question No. 1 and Q.5 are compulsory.***
3) ***From remaining questions attempt any two from each sections.***

SECTION - I

(Agriculture)

Q1) Define or explain the following terms: **[10]**

a) Seed bank

b) GM crop

c) Shuttle vector

d) Metabolic Engineering

e) Hybrid

Q2) a) Define molecular markers. Describe different types of molecular markers. Add a note on application in plant breeding. **[8]**

b) Describe the process involved in cryopreservation. Add a note on DNA banking of germplasm. **[7]**

Q3) a) Define green house technology give construction details of green house with respect to irrigation facility. **[8]**

b) Comment on "Risk assessment while introducing genetically modified products is essential. **[7]**

P.T.O.

Q4) Write short notes on (Any three): **[15]**

a) Ti plasmids

b) IPR

c) Stages of micropropagation

d) Haploids.

SECTION - II

(Health)

Q5) Attempt the following: **[10]**

a) Define Tissue Engineering.

b) Enlist any four applications of cloning.

c) Give the outline of vaccine classification.

d) Write important features of Biosensors.

e) What is meant by artificial insemination.

Q6) a) What are QTLs? Explain any one in detail. **[7]**

b) Explain the epidemiology with reference to Ebola disease. **[8]**

Q7) a) Describe any four Recombinant products for human health. **[8]**

b) Discuss the use of PCR in diagnostics. **[7]**

Q8) Write short notes on the following: **[15]**

a) Hybridoma.

b) Serum free media.

c) Cell culture.

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Total No. of Questions :7]

SEAT No. :

P1012

[Total No. of Pages : 2

[4719]-43
T.Y.B.Sc.
BIOTECHNOLOGY
Bb - 343: Recombinant DNA Technology
(2008 Pattern) (Semester - IV)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

1) ***Question 1 is compulsory.***
2) ***Attempt any 4 out of the remaining questions.***

Q1) Answer the following in 2-4 lines: **[20]**

a) State the role of DNA ligase.

b) What is the role of streaptovidae in southern blotting.

c) Define phagmid vector.

d) Enlist the guidelines in recombinant DNA technology.

e) State any 4 applications of genetically engineered products.

f) What is blue - white screening?

g) How nylon membranes are superior to nitrocellulose paper?

h) Give any 4 strategies for cell lysis.

i) What is difference between southern northern & western blotting?

j) State the use of Trizol in molecular cloning.

Q2) Compare and contrast Sanger's method and Maxam-Gilbert method of DNA sequencing. **[15]**

Q3) a) Explain the construction of cDNA library. **[8]**

b) Describe RFLP in detail. **[7]**

P.T.O.

Q4) a) Describe cosmid vectors & give their significance. **[8]**

b) Distinguish between type I and type III restriction endonucleases. **[7]**

Q5) Write short notes on: **[15]**

a) DNA polymerases

b) DEPC

c) Absorbance ratio at 260 & 280 nm.

Q6) a) Explain any four milestones in genetic engineering. **[8]**

b) Discuss various methods of transformation of prokaryotic cells. **[7]**

Q7) a) Explain site-directed mutagenesis indetail. **[8]**

b) Discuss any four methods used in selection of recombinants. **[7]**

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